CW: 7.1.7- Substitution- Day 2 Name: _____

4 steps to solving a linear system using SUBSTITUTION:

STEP 1: Solve one of the _equations_ for one of its _variables_.

STEP 2: Substitute the _expression_ from Step 1 into the other _equation_ and solve for the other _variable._.

STEP 3: Substitute the value from Step 2 into one of the original _equations_ and solve for the remaining _variable_.

STEP 4: _Check_ your _solutions_ in each of the original equations.

1. Sydney has $40 and is saving $10 per day. Jaeshawn has $160 and is spending $5 per day.

Let x represent the # of days and y represent the amount of money.

a. WRITE and SOLVE a linear system to determine after how many days Sydney and Jaeshawn will have the same amount of money.

S: $y = 10x + 40$

J: $y = -5x + 160$

$10x + 40 = -5x + 160$

$+5x \quad +5x$

$15x + 40 = 160$

$-40 \quad -40$

$\frac{15x}{15} = \frac{120}{15}$

$x = 8$

$y = 10(8) + 40$

$y = 80 + 40$

$y = 120$

(8, 120)

b. Using words, explain your solution in the context of the situation.

In 8 days, they both have $120.

2) $x = (y + 6)$
$2y + 2x = 28$

$2y + 2(y+6) = 28$
$2y + 2y + 12 = 28$
$4y + 12 = 28$
$-12 \quad -12$
$\frac{4y}{4} = \frac{16}{4}$
$y = 4$

$x = 4 + 6$
$x = 10$

(10, 4)

3) $9x + 9y = -9$
$x = -5y - 13$

4) $y = 2x + 4$
$y = 4x - 10$

$(2x+4) = 4x - 10$
$-2x \quad -2x$
$4 = 2x - 10$
$+10 \quad +10$
$14 = 2x$
$x = 7$

$y = 2(7) + 4$
$= 14 + 4$
$y = 18$

(7, 18)

5) $y = 6x - 11$
$-2x - 3y = -7$

$-2x + -3(6x + -11) = -7$
$-2x + -18x + 33 = -7$
$-20x + 33 = -7$
$-33 \quad -33$
$\frac{-20x}{-20} = \frac{-40}{-20}$
$x = 2$

$y = 6(2) - 11$
$y = 12 - 11$
$y = 1$

(2, 1)

6) $y = 4x + 10$
$-8x + 2y = 20$

$-8x + 2(4x + 10) = 20$
$-8x + 8x + 20 = 20$
$20 = 20$

Infinitely Many Solutions

7) $2x - y = 10$
$y = -6x + 6$